

**TECHNICAL REVIEW DOCUMENT
FOR
OPERATING PERMIT 95OPBO059
Modification 1
to be issued to:**

University of Colorado at Boulder, Power House
Boulder County
Facility ID 0130553

Prepared by Long B. Nguyen on November 19, 2001

Summary

The University of Colorado at Boulder ("CU") was using an existing supply of No. 6 fuel oil that was purchased prior to the issuance of Construction Permit 89BO399. The existing supply of No. 6 fuel oil contained 0.92% sulfur by weight, which exceeded the fuel sulfur content limit outlined in the construction permit. Therefore, boilers B003 and B004 were not in compliance with Construction Permit 89BO399 when operating on No. 6 fuel oil. The Division was aware of this fact when the application for Operating Permit 95OPBO059 was submitted for the facility. The Division decided that the operating permit could be issued under one condition – CU could not buy any more No. 6 fuel oil and CU had to follow a schedule to get the boilers into compliance with the fuel sulfur content limit. The compliance schedule was outlined in Condition 6 of the operating permit. One of the items in the compliance schedule was for CU to submit an application to have the operating permit be revised, once all of the No. 6 oil has been removed from the facility. CU submitted an application to the Division on April 9, 2001 for the revision of the operating permit. The Division reviewed the application and the Division determined that the application could be processed as a Minor Permit Modification. The main purpose of the modification was to remove/change all permit conditions that dealt with No. 6 fuel oil. In addition to this main modification, CU also requested that some of the permit conditions be clarified/modified to reflect the current operating conditions of the facility and the current air pollution regulations. The modifications that were made to the original operating permit are as follows:

1) Cover page – The Responsible Official was changed from John Bruning to Richard Monson, as request by CU in the revised permit application.

2) Section I – General Activities and Summary, Condition 1.1

When the operating permit was first issued in January of 1999, the Power House was located in an area designated as non-attainment for carbon monoxide, particulate matter less than 10 um, and ozone. Since then, the area has been re-designated as attainment for ozone. This condition was modified to reflect this fact.

3) Section I – General Activities and Summary, Condition 2.1.1

All of the No. 6 fuel oil has been removed from the facility. There is now only No.2 fuel oil available to be used in all of the equipment. This condition was modified in the operating permit to reflect this fact.

4) Section II – Specific Permit Terms, Condition 1.2

The source requested that this condition be rewritten so that it specifies the reports that are required to be submitted every quarter, rather than the inclusive statement “any required monitoring” reports in the original permit. This condition was rewritten to make it clear that excess emission reports, relative to the 75-ppm NO_x limit, are required to be submitted every quarter.

5) Section II – Specific Permit Terms, Condition 2.2

The emission factors in the operating permit were updated to reflect the most current AP-42 emission factors. The table below summarizes these emission factors. (AP-42, Version 4/2000, Table 3.1-2a)

Pollutant	Emission Factor (lb/mmBtu)	
	Natural Gas	No. 2 Fuel Oil
SO ₂	0.0034	1.01(S)
VOC	0.0021	0.0004
PM	0.0066	0.0120
PM ₁₀	0.0066	0.0120

S = Weight percent of sulfur content in fuel oil

6) Section II – Specific Permit Terms, Condition 2.11

The frequency of the cylinder gas audits for the continuous emission monitoring system was changed from semi-annually to quarterly. The quarterly frequency is more consistent with the Division's policy for CEMS's QA/QC and CFR 40 Part 60, Appendix F.

7) Section II – Specific Permit Terms, Conditions 2.12, 2.13 and 2.14

The source requested that the opacity monitoring requirements in Conditions 2.12, 2.13 and 2.14 be modified, so that they would better reflect that fuel oil is used only during periods of natural gas curtailment. The source believed that the opacity monitoring requirements in the original permit were more suited for continuous operation of fuel oil. After reviewing this request, the Division decided that the opacity monitoring requirements could be modified so that they would be similar to other issued permits with equipment that use fuel oil during periods of natural gas curtailment. This modification is not considered to be a relaxation of the monitoring provisions.

8) Section II – Specific Permit Terms, Conditions 3.1 and 3.2

The emission factors in the operating permit were updated to reflect the most current AP-42 emission factors. The table below summarizes these emission factors. The emission factors for natural gas came from AP-42, Version 3/1998, Tables 1.4-1 and 1.4.2, for boilers that are rated less than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per million standard cubic feet of natural gas. These factors were then converted to terms of pounds of pollutant per million Btus of heat input by assuming a heating value of 1000 Btus/scf of natural gas. The PM and PM₁₀ emission factors represent the addition of the filterable PM and the condensable PM.

The emission factors for No. 2 fuel oil were from AP-42, Version 9/1998, Tables 1.3-1, 1.3-2, and 1.3-3, for boilers rated at less than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per 1000 gallons of fuel oil. These factors were then converted to terms of pounds of pollutant per million Btus of heat input by assuming a heating value of 140,000 Btus per gallon of No. 2 fuel oil.

Pollutant	Emission Factor (lb/mmBtu)	
	Natural Gas	No. 2 Fuel Oil
NO _x	0.100	0.143
CO	0.084	0.036
SO ₂	0.0006	1.01(S)
VOC	0.0055	0.0014
PM	0.0076	0.0236
PM ₁₀	0.0076	0.0236

9) Section II – Specific Permit Terms, Conditions 3.9, 3.10, and 3.11

These conditions have been replaced by Conditions 3.9 and 3.10. See discussion of opacity requirements in item #7 above.

10) Section II – Specific Permit Terms, Condition 3.12

This condition was rewritten to clarify the information that must be included in the semi-annual reports, as required by Subpart Dc, for sources that choose to demonstrate compliance with the sulfur dioxide limit by monitoring the sulfur content of the fuel. The frequency of the reports was changed from quarterly to semi-annually, per Section §60.48c (j).

11) Section II – Specific Permit Terms, Condition 4.1

The emission factors in the operating permit were updated to reflect the most current AP-42 emission factors. The table below summarizes these emission factors. The emission factors for natural gas came from AP-42, Version 3/1998, Tables 1.4-1 and 1.4.2, for boilers rated greater than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per million standard cubic feet of natural gas. These factors were then converted to terms of pounds of pollutant per million Btus of heat input by assuming a heating value of 1000 Btus/scf of natural gas. The PM and PM₁₀ emission factors represent the addition of the filterable PM and the condensible PM.

The emission factors for No. 2 fuel oil came from AP-42 Version 9/1998, Tables 1.3-1, 1.3-2, and 1.3-3, for boilers rated greater than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per 1000 gallons of fuel oil. These factors were then converted to terms of pounds of pollutant per million Btus of heat input by

assuming a heating value of 140,000 Btus per gallon of No. 2 fuel oil.

Pollutant	Emission Factor (lb/mmBtu)	
	Natural Gas	No. 2 Fuel Oil
NO _x	0.28	0.171
CO	0.084	0.036
SO ₂	0.0006	1.12(S)
VOC	0.0055	0.0014
PM	0.0076	0.0236
PM ₁₀	0.0076	0.0236

S = Weight percent of sulfur content in fuel oil

12) Section II – Specific Permit Terms, Condition 4.2

This condition was rewritten to clarify that the boiler would be in compliance with the short-term PM emission limit if the only two types of fuel used in the boiler were natural gas and No. 2 fuel oil.

13) Section II – Specific Permit Terms, Condition 4.4

The facility now has only No. 2 fuel oil. Therefore, the No. 6 fuel oil in this condition was replaced with the No. 2 fuel oil.

14) Section II – Specific Permit Terms, Conditions 4.6, 4.7, and 4.8

These conditions were replaced by Conditions 4.6 and 4.7. See discussion of opacity requirements in item #7 above.

15) Section II – Specific Permit Terms, Condition 5.1

The emission factors in the operating permit were updated to reflect the most current AP-42 emission factors. The table below summarizes these emission factors. The emission factors for natural gas came from AP-42, Version 3/1998, Tables 1.4-1 and 1.4.2, for boilers greater than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per million standard cubic feet of natural gas. These factors were then converted to terms of pounds of pollutant per million Btus of heat input by assuming a heating value of 1000 Btus/scf of natural gas. The PM and PM₁₀ emission factors represent the addition of the filterable PM and condensible PM.

The emission factors for No. 2 fuel oil came from AP-42 Version 9/1998, Tables 1.3-1, 1.3-2, and 1.3-3 for boilers greater than 100 mmBtu/hr. The emission factors were given in terms of pounds of pollutant per 1000 gallons of fuel oil. These factors were

then converted to terms of pounds of pollutant per million Btus of heat input by assuming a heating value of 140,000 Btus per gallon of No. 2 fuel oil.

Pollutant	Emission Factor (lb/mmBtu)	
	Natural Gas	No. 2 Fuel Oil
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VOC	0.0055	0.0014
PM	0.0076	0.0236
PM ₁₀	0.0076	0.0236

S = Weight percent of sulfur content in fuel oil

16) Section II – Specific Permit Terms, Condition 5.2

This condition was rewritten to clarify that the boiler would be in compliance with the short-term PM emission limit if the only two types of fuel used in the boiler were natural gas and No. 2 fuel oil.

17) Section II – Specific Permit Terms, Conditions 5.6, 5.7, and 5.8

These conditions were replaced by Conditions 5.6 and 5.7. See discussion of opacity requirements in item #7 above.

18) Section II – Specific Permit Terms, Condition 6

This condition was deleted from the operating permit because the source has fulfilled all of the requirements that were outlined in this condition.

19) Section III – Permit Shield, Condition 1

The source requested that a permit shield from NSPS, Subpart Db be added for boilers B003 and B004. This is because the boilers were built before the NSPS applicability date. The Division granted the source's request and added a permit shield for Boilers B003 and B004.